Orders of Common Landscape Insects

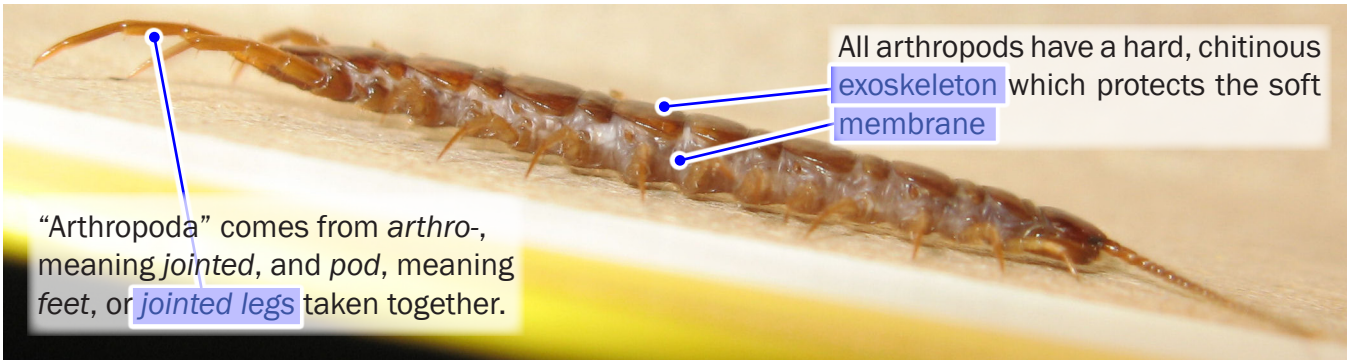
Photographs by Joel Gardner unless otherwise noted.

= Ametabolous = Hemimetabolous = Holometabolous = Pollinator = Herbivorous = Predaceous = Detritovorous

= Beneficial = Benign = Pest

phylum Arthropoda

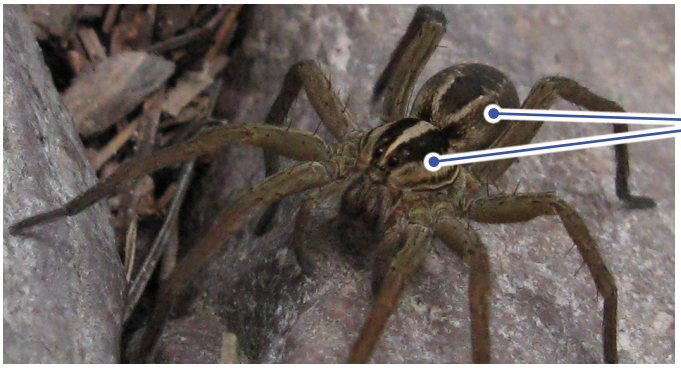
insects, arachnids, crustaceans, myriapods



Key characters are highlighted in blue. Follow the blue lines to see these characters in the photograph. Key characters are traits unique to one group of organisms that can be used to identify which group an organism belongs to. Since the centipede above has jointed legs and a hard exoskeleton, you know it is an arthropod. There are many key characters for every group, but only a few of the more easily seen ones will be highlighted here.

class Arachnida

spiders, scorpions, mites, harvestmen



Arachnids have eight legs (although some immature mites have only six) and two general body segments: the cephalothorax (fused head and thorax) and the abdomen. Sometimes the division between the two segments is so indistinct as to be unnoticeable (as in mites and harvestmen).

order Araneae

spiders

David Cappaert, Michigan State Univ., Bugwood.org

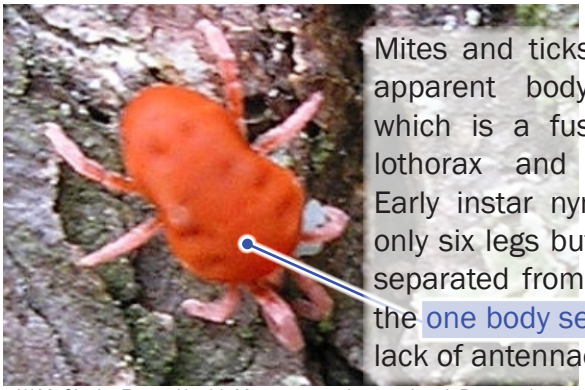
Spiders have a distinct cephalothorax and abdomen, one pair of chelicerae (fangs) with venom, one pair of pedipalps without venom (often larger and more easily seen), and a pair of spinnerets at the tip of the abdomen for spinning silk. Some spiders actively hunt and only spin silk in caring for eggs.

class Arachnida (continued)

spiders, scorpions, mites, harvestmen

subclass Acari

mites and ticks



Mites and ticks have one apparent body segment which is a fused cephalothorax and abdomen. Early instar nymphs have only six legs but are easily separated from insects by the one body segment and lack of antennae.

W.M. Ciesla, Forest Health Management International, Bugwood.org

Clemson University - USDA CES, Bugwood.org

Beneficial predatory mites can be distinguished from herbivorous pests by their movements. Predators will run quickly in a random search for prey, while pests tend to stay in one place and move only slowly.

order Opiliones

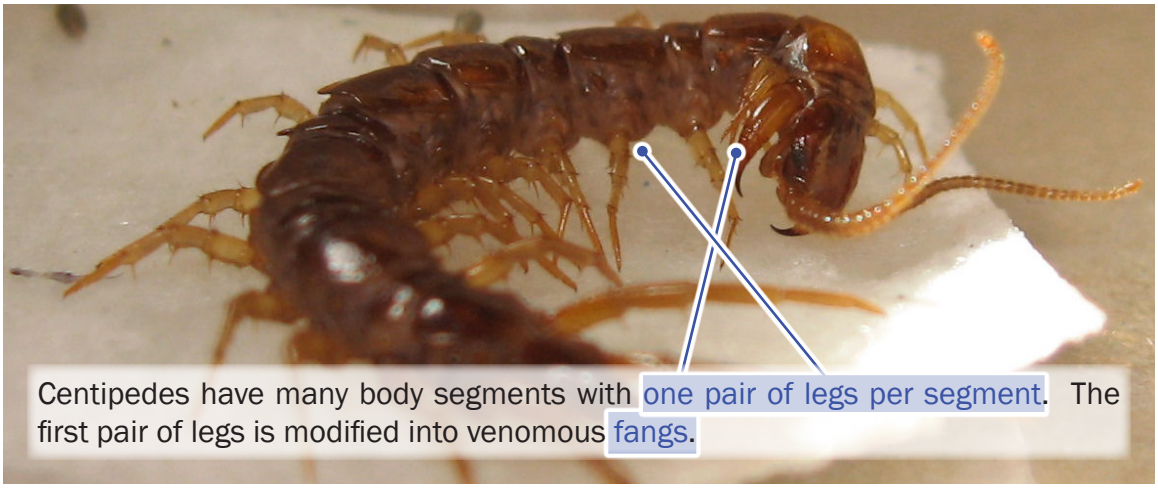
harvestmen/daddy longlegs

Jerry A. Payne, USDA Agricultural Research Service, Bugwood.org

Harvestmen have one apparent body segment, similar to Acari. Most have very long legs, hence the common name "daddy longlegs", although some predatory species have more spiderlike legs. Separated from spiders by single body segment and lack of spinnerets.

class Chilopoda

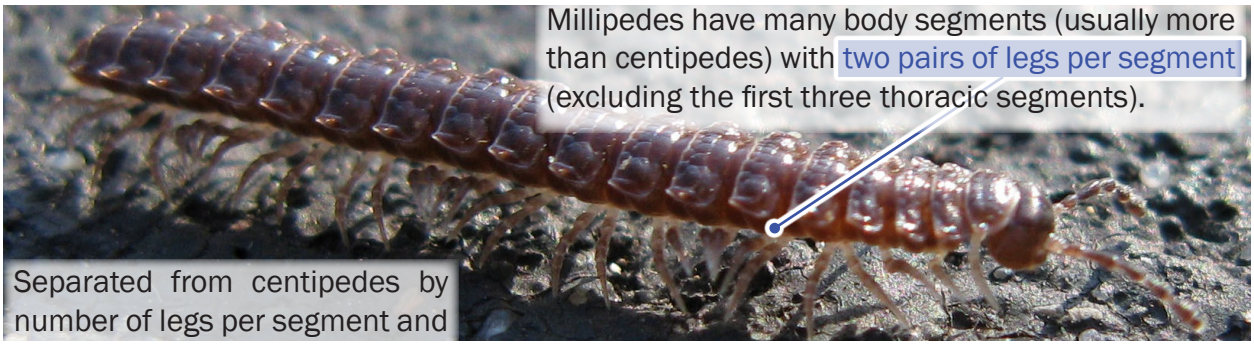
centipedes



Centipedes have many body segments with one pair of legs per segment. The first pair of legs is modified into venomous fangs.

class Diplopoda

millipedes



Millipedes have many body segments (usually more than centipedes) with two pairs of legs per segment (excluding the first three thoracic segments).

Separated from centipedes by number of legs per segment and lack of fangs.

subphylum Crustacea

crabs, lobsters, crayfish, shrimp, isopods

Head, thorax, and abdomen may be variously fused in different groups with different numbers of segments. All crustaceans have two pairs of antennae (but this is extremely difficult to see in isopods).

order Isopoda

woodlice, rock slaters

The only terrestrial crustaceans are isopods. Most commonly encountered are woodlice (pillbugs and sowbugs). Pillbugs are rounder and can curl into a defensive ball; sowbugs are flatter and cannot roll up. All isopods have seven pairs of legs and breathe via gills underneath the abdomen.

epiclass Hexapoda

insects, proturans, diplurans, springtails

"Hexa" means six and "poda" means feet—hexapods are characterized by having six legs. They also have distinct head, thorax, and abdomen segmentation, one pair of antennae, and a passive respiratory system composed of tubes opening to the outside air through spriacles.

class Collembola

Susan Ellis, Bugwood.org

springtails

Very minute and often overlooked except when in large groups. Formerly classified as insects. Characterized by ventral appendage called the furcula which can spring the animal into the air—hence the name "springtails".

class Insecta

insects

order Thysanura

silverfish, firebrats

Primitive, wingless insects with flattened bodies covered with scales. Characterized by the three caudal filaments at the tip of the abdomen. They are frequently pests when they inhabit homes.


Joseph Berger, Bugwood.org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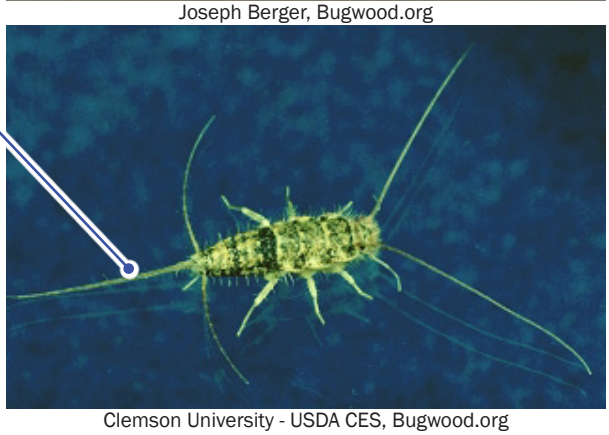
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class Insecta (continued)

insects

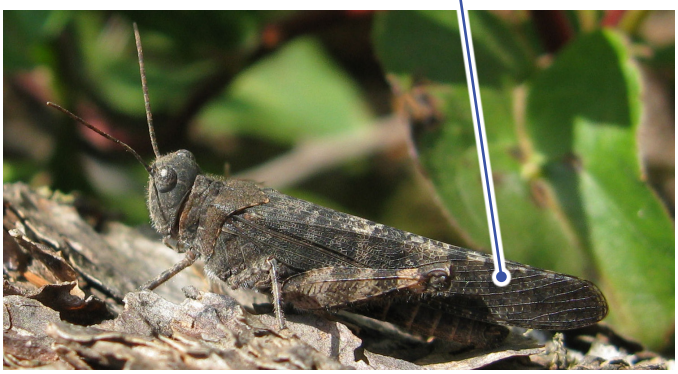
order Orthoptera

grasshoppers, crickets, katydids

These insects are easily recognized by the enlarged hind legs modified for jumping (*saltatorial*). Wings, when present, are held roof-like over the abdomen. Forewings are thickened and leathery to protect membranous hindwings. Some adult grasshoppers have only vestigial wing pads and many crickets lack wings entirely.

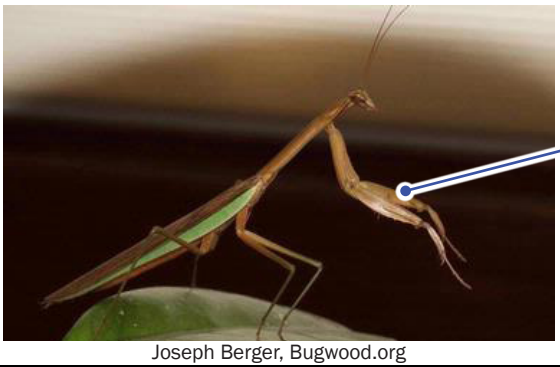
Mole crickets (family Gryllotalpidae) live underground and have modified forelegs with claws (*fossorial*) for digging.

Johnny N. Dell, Bugwood.org



order Mantodea

praying mantids



Joseph Berger, Bugwood.org

Praying (or preying) mantids are characterized by the highly modified forelegs used for catching and grasping prey (*raptorial*). Wings are similar to those of Orthoptera. Mantid egg cases (ootheca) are often placed in gardens as a means of biological control. However, the mantids will eat beneficial insects as well as pests.

order Blattodea

cockroaches

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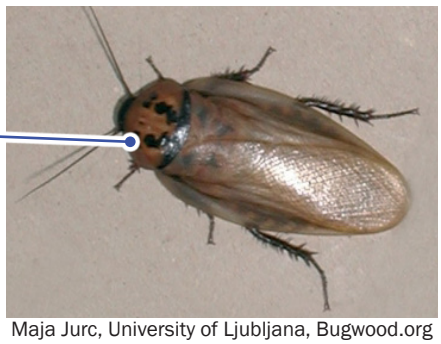
Beetlelike, but the wings are thin and membranous or absent, and the pronotum extends over the head from above. Most species are benign; only six frequently infest human dwellings.



Maja Jurc, University of Ljubljana, Bugwood.org

class Insecta (continued)

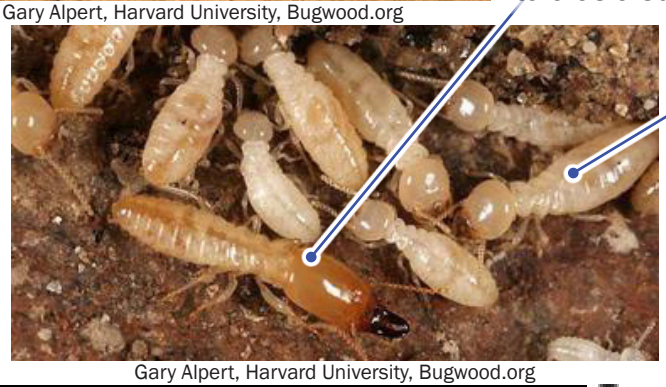
insects

order Isoptera

termites

Gary Alpert, Harvard University, Bugwood.org

All species have highly advanced eusocial behavior. Nest in wood or build structures of mud. Winged reproductives are recognized by the identical fore and hindwings, but most individuals are flightless, non-reproductive workers or soldiers. Some new classifications place Isoptera as a suborder within Blattodea.



Gary Alpert, Harvard University, Bugwood.org

Dennis Haugen, Bugwood.org

order Dermaptera

earwigs

Gary Alpert, Harvard University, Bugwood.org

These unusual insects are unmistakable due to the larrge terminal forceps on the abdomen, which are used in defense and courtship. The forewings are very short and leathery and protect the membranous hindwings, which are folded up underneath. A commonly encountered species is the invasive European earwig, *Forficula auricularia*, which can be found under plant pots feeding on roots.

order Psocoptera

book lice, bark lice

Small; often found in large groups on tree trunks. Despite large numbers, they are benign, feeding only on lichen and fungi. Distinguished by long, thin antennae and enlarged, "humpbacked" thorax. Wings are sometimes absent.

Jessica Lawrence, Eurofins Agroscience Services, Bugwood.org

David Cappaert, Michigan State University, Bugwood.org

class Insecta (continued)

insects

order Hemiptera
suborder Heteroptera

true bugs

A very large and diverse group of insects. Most suck plant juices, but there are also many important predators including assassin bugs. Distinguished by the forewings (*hemelytra*), which are opaque and hardened on the basal half, but clear and membranous on the distal half. The wing tips are crossed when at rest.

A predatory assassin bug.

order Hemiptera
suborders Auchenorrhyncha, Sternorrhyncha

cicadas, planthoppers, aphids, scales

David Cappaert, Michigan State University, Bugwood.org

David Cappaert, Michigan State University, Bugwood.org

This group includes many important crop and greenhouse pests. All suck plant juices and may transmit plant diseases. Many are soft-bodied. Wings, when present, are held roof-like over the body and often have very minimal venation. Scale insects are unique in that they have no legs and are completely sessile. Aphids can reproduce by parthenogenesis, without mating. Cicadas are some of the longest-lived insects; the periodical cicada spends 17 years as a nymph underground.

A. Steven Munson, USDA Forest Service, Bugwood.org

Whitney Cranshaw, Colorado State University, Bugwood.org

David Cappaert, Michigan State University, Bugwood.org

class Insecta (continued)

insects

order Thysanoptera

thrips

Jack T. Reed, Mississippi State University, Bugwood.org

Tiny, but distinctive insects. Wings, when present, are very narrow and fringed with long hairs. The mouthparts are asymmetrical with only one mandible used for scraping leaves or piercing and sucking. Most thrips are herbivorous pests but a few are predaceous. The name "thrips" is both singular and plural; one individual is called a thrips, not a thrip.


Jack T. Reed, Mississippi State University, Bugwood.org

order Neuroptera

lacewings

Recognized by the large, delicate wings with many veins, giving them a net or lace-like appearance. The antennae are also long and thin. Green lacewing larvae are important biological control agents of aphids. Most lacewing adults eat pollen, but mantidflies (Mantispidae), which have raptorial forelegs like a mantis, are predaceous.

order Mecoptera

scorpionflies, hangingflies


Howard Ensign Evans, Colorado State University, Bugwood.org

The mouthparts are at the end of an elongated snout. Male scorpionflies are easily recognized by the abdomen, which is curled and enlarged like a scorpion's tail (but is not capable of stinging). Hangingflies (Bittacidae) are so called for their habit of hanging from one leg.


Susan Ellis, Bugwood.org


David Cappaert, Michigan State University, Bugwood.org

class Insecta (continued)

order Coleoptera

insects

beetles

The largest order of insects. Beetles encompass virtually all ecological niches. The main identifying feature is the forewings (elytra), which are thickened and hardened into a protective cover for the hindwings and abdomen. Only the hindwings are used for flying. The elytra lie parallel to each other when at rest so that a straight, narrow seam can be seen down the middle of the abdomen. A few groups such as rove beetles (Staphylinidae) have shortened elytra that do not cover the abdomen.

Longhorned beetles (Cerambycidae) usually have very long antennae. Many are pests that bore in trees.

Buprestid beetles also bore in trees. They are characteristically bullet-shaped and often beautifully colored.

Ladybugs (Coccinellidae) are well-known beneficial predators. The invasive multicolored Asian lady beetle (*Harmonia axyridis*), however, tends to invade homes and can displace native ladybugs. Colors are highly variable but most *H. axyridis* have a black "M" pattern on the pronotum.

class Insecta (continued)

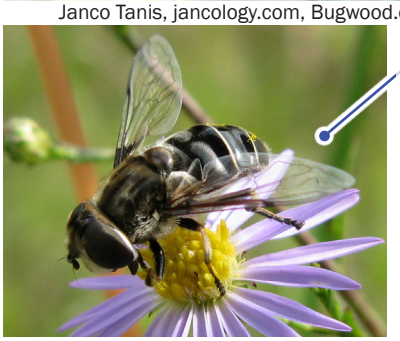
insects

order Diptera

Janco Tanis, jancology.com, Bugwood.org

All true flies have only one pair of wings; the hindwings are much reduced into halteres used for maintaining balance in flight.

Many flies, especially mosquitoes, are known for being pests, but many others like tachinids are beneficial parasitoids.



Flower flies (Syrphidae) are notably beneficial. The larvae are predators on aphids and other pests, while the adults are pollinators.

Joseph Berger, Bugwood.org

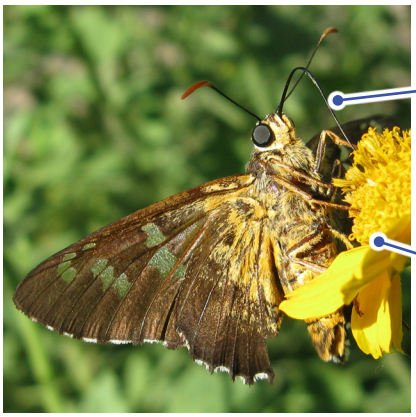
flies

order Lepidoptera

butterflies, moths

Very distinctive, with large wings covered in scales which may form patterns used in species recognition. Most adults are pollinators, but the herbivorous larvae (caterpillars) are often pests.

Mouthparts, when present, are a tightly coiled tube for sucking nectar (*proboscis*). Some female moths lack wings.



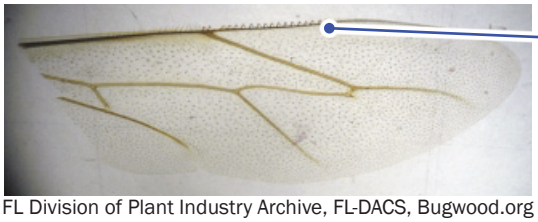
Butterflies tend to be diurnal, thinner, have clubbed antennae, and do not fold their wings. Moths are often nocturnal, bulkier, with threadlike or plumose antennae, and fold their wings over the abdomen at rest. Skippers (Hesperiidae) are intermediate between the two, with hooked antennae.

class Insecta (continued)

order Hymenoptera

insects

bees, wasps, sawflies, ants



FL Division of Plant Industry Archive, FL-DACS, Bugwood.org

The fore and hindwings are linked together by tiny hooks on the hindwing (*hamuli*), giving the appearance of a single large wing. A narrow constriction or "waist" is present between the thorax and abdomen, except in sawflies. The first antenna segment (*scape*) is often elongated, creating a sharp "elbow" joint (but many parasitic wasps, sawflies, and male bees lack this).

Honey bees (*Apis mellifera*) are the most familiar Hymenoptera. They have highly complex social behavior with a queen and sterile workers, produce and store honey, and are responsible for most crop pollination. Most bees, however, are solitary and do not make honey. As honey bees are increasingly stressed by disease and parasites, we are coming to depend more on these solitary bees for pollination. The blue orchard bee (*Osmia lignaria*) is a solitary wood-nesting bee which is managed commercially for pollination of apples, almonds, and other spring-blooming crops.

Ants (Formicidae) are all highly social. Most are wingless; only new reproductives have wings. They are often pests as they will protect aphids from harm in order to harvest the aphids' honeydew.

Vespid wasps (including paper wasps and yellow jackets) are usually social and predatory. All other wasps, however, are solitary parasitoids on a wide range of arthropod hosts. Braconids are especially important biological control agents of aphids and caterpillars.

Roger Ryan, USFS PNW Station, Bugwood.org